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Mr. Fred Cataneo
U.S. Environmental Protection Agency
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Re: COMMENTS ON THE VINELAND CHEMICAL COMPANY SITE: DRAFT FEASIBILITY STUDY FOR UNION LAKE

Dear Fred:

The following are comments on the draft FS for Union Lake:

Page E-3: The report states that it could not be determined to what extent, or at what rate, arsenic levels in Union Lake waters would decrease if upstream sources were eliminated. It would be useful to identify the data gaps and how to fill them to determine the "controlling mechanism" for the arsenic content in the lake waters. Determination of the effect of sediment arsenic levels on water quality is an important factor in the selection of a remediation alternative. This comment applies wherever this issue is raised throughout the report.

The estimate for arsenic in the lake has changed from 360 metric tons to 150. What is the reason for this? What is the basis for this new estimate?

Page E-5 This FS for Union Lake presents only 10^{-5} alternatives. What happened to the 10^{-6} alternatives (20 ppm sediment cleanup value)? Both alternatives should be presented, and compared.

The statement is made that supernatant from a sediment extraction system could be treated to meet MCL's and discharged back into Union Lake. Unless the treatment provides for NONDETECT total arsenic, this proposal has the same regulatory problems that the discharge of treated ground water from the site to the Blackwater Branch of the Maurice River has.

The target clean up level of 120 ppm for sediments does not correspond to 2×10^{-6} risk as stated. This should be corrected. (this comment refers to most plausible case).

Page E-7, 1-30: It is unclear why all alternatives address only dredging and why all remedial alternatives must be considered with Union Lake at a full level. EPA should present options if the lake is lowered for remediation. Other options, such as fixing in place, use of filter fabric, etc. may be more feasible and cost effective under these conditions, and it

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would definitely be easier to sample sediments to confirm the locations of the highest arsenic without the interference of water, to ensure the excavation of the right areas, and to ensure the proper placement of any clean fill.

Page E-9: Report should also include hybrid cases as alternatives. Example: Cleaning the beach area and yacht club area to 10^{-6} risk and everywhere else a 10^{-5} risk.

Page 1-18: If the greatest concentrations of arsenic in water are in summer and fall, and the lowest concentrations are seen in the winter, are the highest sediment concentrations seen in the winter? This may be important in the timing of sediment removal for treatment so that as much of the arsenic is in the recoverable sediments as possible.

Figure 1-6: It is interesting to note that at the proposed cleanup number of 120 mg/kg total arsenic in the sediments, the majority of the DEP sample sites that exceeded that level would be exposed and accessible by conventional soil sampling equipment and earth moving equipment.

Page 1-24: It makes sense not to concentrate cleanup efforts within the main channel where the least arsenic would be expected to have accumulated. Quiet waters allow for the settlement of fine particles amenable to arsenic attenuation, and shallow waters favor production of plants and organic matter accumulation which is also amenable to the binding of arsenic.

Page 1-27: The risks scenarios used assume constant concentrations in both water and soil over a 70 year exposure. Data from upstream water indicates that concentrations of arsenic are dropping dramatically (4 orders of magnitude in 7 years) implying that the risk is not constant and could decrease over time. A 70 year time-weighted average concentration should be estimated and presented.

General Comment:
Summary of Risks on Page 1-26 and risk levels calculated from action levels and safe water drinking levels indicate that a 20 ppm sediment level and ingestion risk is 2×10^{-6} cancers/lifetime (CPL) and ingestion of water (non-voluntary) is about 6×10^{-6} CPL (current water levels are around the Clean Water Act level of 50 ppb). The addition of these two principle risks results in a total risk of 8×10^{-6} CPL which approaches the no-action current risk of 1×10^{-5} CPL for the lake (current risk is 1×10^{-5} CPL).

Page 1-28: "Pathways of Exposure". Ebasco has limited the area sediment ingestion exposure to the submerged lake bottom that is 2.5 feet below the surface. Three to four feet is more appropriate since adults can wade to this depth and suspend sediments that may be ingested by the nearby children.

Page 1-30: The FS states that surface water quality in the lake can be monitored after commencement of ground water containment at the Vichem plant site. This should be a required part of Union Lake or the Plant Site remediation efforts, if it is not already, in order to see how a change in "influent" water arsenic concentrations affects the arsenic levels in the water throughout Union Lake.

Page 1-31: The FS should assess the cost/benefits of remediation alternatives with the lake at a maximum drawdown level for comparison to the cost/benefits of remediation with the lake at its full level. Initially, costs may be saved under drawdown conditions related to time, effort, elimination of dewatering step of a treatment process, eliminate effects of dredging, increase the accuracy in the location and excavation of contaminated materials and the placement of clean fill, etc.

Page 2-2: Explain reason number 2 for not addressing remediation alternatives for water. Once the site and river are remediated, this influx will eventually not be a factor.

Page 2-2, 23: Arsenic in the lake water is a result of both desorption of arsenic from lake sediments and input from the Maurice River. The magnitude of input from these two vectors must be determined in order to implement any sound remediation. In the case of the Lake, if the desorption of arsenic from sediments will produce undesirable arsenic concentration in the water column, then further evaluation and treatment of these sediments is needed and remediation of input water would be futile in reducing the arsenic risk in the lake.

Page 2-4: Department representatives attended a meeting in which they agreed to evaluate risk levels above $1x10^{-6}$ CPL. Please make it clear to Ebasco that NJDEP did not decide at this or any other time that $1x10^{-5}$ CPL was an acceptable risk.

Page 2-5 The second paragraph from the bottom is also misleading. The 20 ppm is a guidance value, however, the NJDEP has made no position on a cleanup action level to date.

Page 2-7 The first paragraph: the NJDEP is still discussing the issue of the appropriate cleanup value of arsenic vs risk. The NJDEP has not finalized its position in this matter.

Ebasco states that arsenic is an inorganic element which undergoes biodegradation. This is not true. Arsenic is a phosphorus analog and is involved in several biochemical cycles. Please have Ebasco correct this error.

Page 2-25: The assumption that leachates from the coarse washed sand would contain a low enough arsenic concentration that it would be considered delistable should be verified. This is critical to many of the alternatives being truly feasible.

The end product after fixation may still have to be delisted before being classified as non-hazardous. Check on this.

Page 2-32: Where within "side boundaries" would the RCRA Landfill be constructed?

Page 2-35: Ocean Disposal - Is the testing/permitting process for ocean disposal of treated sediments more long and involved than delisting and landfilling? As in the River Areas Feasibility Study, this option seems to have been dismissed prematurely.

Page 2-41: Off Site Wastewater Treatment - This FS references the existing Vichem wastewater treatment plant and states that its capacity and treatment capability are such that it cannot accept an additional waste stream. Why isn't the expanded wastewater treatment facility needed on the Vichem plant site for ground water treatment considered? The FS should compare the cost effectiveness of utilizing two wastewater treatment systems at two locations to the cost effectiveness of one larger treatment system capable of treating all waste streams and necessary transportation costs or pipeline costs to get the wastewater to the "central" treatment works.

Table 2-3: The removal options of bulldozer and front end loader should not be eliminated. There effectiveness should be assessed in alternatives which are meaningful under lake drawdown conditions.

Page 3-4 The New Jersey Surface Water Quality Standards furnish the ambient, in stream water quality standards to be attained or preserved in that waterway. Why is "after treatment" included here? Also, while design of a treatment works to meet the instream standard may suffice for a stream below its standard, it is not a safe design standard to use if the stream/waterway already exceeds that designated standard.

Page 3-7: "Separation of coarse and fine sediment particles". Ebasco proposed to separate fine sediments from coarse sediments as part of the remediation on the assumption that the majority of the arsenic contamination is confined to the fine sediments. Though current data suggests this to be true, confirmatory analysis of arsenic needs to be done for a variety of size fractions of sediment.

General Comment: Risk levels for principle exposure routes are additive. Therefore, if EPA is accepting a total risk of $1x10^{-5}$ CPL then the individual risk levels must be less than $1x10^{-5}$ CPL. The use of 120 ppm sediment level which has a risk of $1x10^{-5}$ CPL plus the water ingestion risk $6x10^{-6}$ CPL results in a total risk of 1.610^{-5} CPL, which is 60% higher than the proposed accepted risk.

Page 3-12: What is the cost of transporting the supernatant to the Vichem site for treatment with the contaminated ground water compared to the cost of building, operating and maintaining a separate treatment works at Union Lake. Also, if fixation is the technology selected to be applied to both the soils at the Vichem site and the sediments in Union Lake, could the same fixation facilities be used to fix both in one location?

Page 3-16: The statement that alternative 2A "...would remove contamination from the site" is inaccurate. As proposed and examined, this alternative would remove sediments in select locations which have total arsenic concentrations greater than 120 mg/kg. Other deeper portions of Union Lake still contain arsenic, and some sediments may contain total arsenic at levels greater that 120 mg/kg.

Page 3-19: Wastewater may have to meet NONDETECT levels of total arsenic, not an arsenic MCL. Keep this in mind. The consolidation of wastewater treatment streams would also mean only one discharge has to be maintained and monitored and agreed to by the NJDEP.

Page 3-21: Clarify the basis behind the deposition in the lake of extracted sediments.

Page 4-13: "Overall Protection of Human Health". No-action alternatives, though they do not reduce the level of contamination, do offer some protection to the public because of institutional and education controls. This is stated on Page 3-11 and 4-10 and contradicts the comments on page 4-13.

General comments on extraction alternatives. A simpler means of treating dredged contaminated soils would be a passive controlled leaching operation. Contaminated sediments could be temporarily landfilled in a triple lined leachate collection facility, water would be passed over the sediments, and the resultant leachate would be treated in a waste water treatment facility similar to that proposed for the main plant groundwater. This process may take somewhat longer to complete but the resultant sediments can then be left in place after the levels of arsenic in the leachate reach acceptable levels.

Since reductions in the concentration of arsenic in the surface water may be the result of upstream controls and remediation, and the concentration of arsenic in the lake water may impact the overall lake remediation, it would be prudent for EPA to establish interim monitoring program for the arsenic in the lake water and selected sediments since remediation is scheduled to occur in about 5 years.

Page 4-13 : The no-action alternative would be just as protective of human health and the environment in that instead of removing the sediments it would eliminate the pathway to them.

Page 4-16 : Where is the designated site for the fixation process?

Page 4-30 : The waste is being treated to change its designation as hazardous to non-hazardous. This should require the delisting process.

Page 4-32: Clarifier water would have to be tested/treated before it could be returned to the lake.

General: Will any sediment resampling take place to confirm sediment removal locations, identify any changes in the distribution of the lake sediment arsenic, etc. Also, will any post dredging/excavation sampling occur prior to the placement of any clean fill in the dredged/excavated areas?

Should you have any questions, please call me at (609) 984-0980

Very truly yours,

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